

EXECUTIVE SUMMARY

INTRODUCTION AND PURPOSE

As a result of Teaming With Wildlife (TWW) efforts sustained for more than a decade by fish and wildlife conservation interests across the country, and as a compromise to failed efforts to pass the Conservation and Reinvestment Act, Congress created the Wildlife Conservation and Restoration Program (WCRP) in 2001 and the State Wildlife Grant (SWG) Program in 2002. The purpose of SWG is to help state and tribal fish and wildlife agencies address conservation of fish and wildlife species of greatest conservation need. Funds appropriated under SWG are allocated to states according to a formula that takes into account each state's size and population. To date, Maine has received nearly \$2.5 million in SWG funds to support work on many of the state's rare, Threatened, Endangered, and nongame wildlife.

To be eligible for additional federal grants, and to satisfy requirements for participating in the State Wildlife Grant program, Congress charged each of the 56 States and Territories with developing a statewide *Comprehensive Wildlife Conservation Strategy* (CWCS or Strategy). Strategies are to provide a foundation for the future of wildlife conservation and serve as a stimulus to engage the states, federal agencies, and other conservation partners to strategically think about their individual and coordinated roles in prioritizing conservation efforts. State fish and wildlife agencies are leading the effort to develop these strategies, but the goal is to create a vision for conserving the States' wildlife, not just develop an agency plan. These efforts are being coordinated through the TWW Committee and the International Association of Fish and Wildlife Agencies (IAFWA) at the regional and national level. To remain eligible for SWG funding, State strategies must be submitted to the National Advisory Acceptance Team (NAAT) for review and approval by October 1, 2005.

Congress identified eight required elements to be addresses in each State's CWCS, and also directed that strategies identify and focus on "species of greatest conservation need" (SGCN), yet address the "full array of wildlife" and wildlife-related issues keeping common species common. Strategies must provide and make use of these eight elements:

1. Information on the distribution and abundance of species of wildlife, including low and declining populations as the State fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the State's wildlife; and
2. Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (1); and
3. Descriptions of problems that may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors that may assist in restoration and improved conservation of these species and habitats; and
4. Descriptions of conservation actions proposed to conserve the identified species and habitats and priorities for implementing such actions; and

5. Proposed plans for monitoring of species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions; and
6. Descriptions of procedures to review of the strategy at intervals not to exceed 10 years; and
7. Plans for coordinating the development, implementation, review, and revision of the plan with Federal, State, and local agencies and Indian tribes that manage significant land and water areas within the State or administer programs that significantly affect the conservation of identified species and habitats.
8. Congress also affirmed through this legislation that broad public participation is an essential element of developing and implementing these plans, the projects that are carried out while these plans are developed, and the Species in Greatest Need of Conservation that Congress has indicated such programs and projects are intended to emphasize.

ROADMAP TO THE EIGHT ELEMENTS

To facilitate review of Maine's CWCS, we address each of the eight required elements in separate chapters (Table 1).

Table 1. Locations of the Eight Required Elements in Maine's CWCS.				
Required Element	Chapter	Tables	Figures	Appendices
1 – Distribution and Abundance of Wildlife	3.0	2-24	1	3, 4
2 – Key Habitats and Natural Communities	4.0	25-29	2-15	5,6,7,8,9
3 – Problems, Priority Research, & Survey Efforts	5.0	30-36	16	5, 10
4 – Conservation Actions	6.0	30-35, 37-42	17,18,19	5, 10, 11, 12, 13
5 – Monitoring	7.0	43-45	20	-
6 – Periodic Review	8.0	46	-	-
7 – Coordination with Conservation Partners	9.0	47-53	-	-
8 – Public Involvement	8.1, 10.0	-	-	14

VALUE OF CWCS TO MAINE

The value of Maine's CWCS extends far beyond the requirements of SWG and beyond the missions of MDIFW and DMR. Indeed, this is an historic opportunity and challenge for both agencies and their conservation partners to provide effective and visionary leadership in conservation of all wildlife occurring in Maine. Never before has such a comprehensive effort been done in our state and every other state in the nation.

This Strategy addresses the full array of fish and wildlife and their habitats in Maine, including vertebrates and invertebrates, and targets species in greatest need of conservation while keeping "common species common." Maine's CWCS is intended to supplement, not duplicate, existing fish and wildlife programs, because it builds on a species planning effort ongoing in

Maine since 1968; a landscape approach to habitat conservation, *Beginning with Habitat*, initiated in 2000; and a long history of public involvement and collaboration among conservation partners. This Strategy covers the entire state, and is designed to be dynamic, responsive, and adaptive.

Maine's CWCS is not a fixed set of conservation objectives and strategies. Rather, it is a series of processes that can be used to identify priorities for individual species, as well as at the landscape level. The Strategy will serve as the foundation for fish and wildlife conservation that will guide the collaborative efforts of state and federal agencies, tribes, conservation partners, and individuals to ensure success. It is our goal that Maine's CWCS be elegant in its simplicity and comprehensive in its process.

Ensuring long term, stable, and adequate funding will be critical to CWCS implementation. The State Wildlife Grant Program is an important first step in funding SGCN conservation, but far more is needed. To make the most of SWG funds, and to demonstrate success, Maine will need to identify required matching stateside funds, which often challenges the State's lean coffers. Nonetheless, demonstrating success will be key to continued Congressional support.

STATE OVERVIEW

Located at the northeast tip of the United States, the State of Maine is approximately 320 miles long and 210 miles wide and is about halfway between the equator and the North Pole. It is a unique state in that it is almost as large (33,315 mi²) as all other New England states combined, with a human population of approximately 1.2 million, or about one person per 36 mi².

Maine has enormous, natural variety and owes its biological wealth to its 17.5 million acres of vast forests, rugged mountains, more than 5,600 lakes and ponds, 5,000,000 acres of wetlands, 31,800 mi of rivers and streams, 4,100 mi of bold coastline, and 4,613 coastal islands and ledges. Maine is the most heavily forested state in the nation, but also contains some of the most significant grassland and agricultural lands in the Northeast.

Maine is a transition area, and its wildlife resources represent a blending of species that are at or approaching the northern or southern limit of their ranges. The species most familiar to us – birds (292 species), non-marine mammals (61 species), reptiles (20 species), amphibians (18 species), inland fish (56 species), and marine species (313 – chordates, fishes, and mammals) – actually comprise less than two percent of the known wildlife species in the state. Over 16,000 species of invertebrates, 2,100 species of plants, 310 species of phytoplankton, 271 species of macrophytes, and 3,500 species of fungi have been documented, but experts believe many times these numbers actually exist.

Since European settlement, at least 14 species of wildlife have been extirpated from Maine. To prevent further loss of wildlife species at risk, the Maine Legislature enacted the Maine Endangered Species Act (MESA) in 1975. In 1986, Maine's first list of 23 Endangered and Threatened species was adopted. Currently, 49 species of fish and wildlife are listed as Endangered or Threatened in Maine, either under Maine's Endangered Species Act, the U.S. Endangered Species Act (ESA), or both.

Public concern for the conservation of all of Maine's wildlife has grown in the past two decades. In the mid-1980s, MDIFW initiated a nongame and endangered wildlife program and has since fully integrated nongame responsibilities throughout its Wildlife Division. Complementary programs to conserve rare plants and natural communities were also established in the Maine

Natural Areas Program (MNAP) within the Department of Conservation. Maine is also part of the Natural Heritage Program (NatureServe), a national initiative to track and assess biodiversity.

Fish and wildlife play an important role in the lives of Maine people. Maine ranks sixth nationally when comparing the percentage of people who participate in hunting, fishing, trapping, and wildlife related outdoor recreation. However, fish and wildlife provide more than a source of enjoyment and recreation. A University of Maine report estimated that fish and wildlife related recreation contributed over one billion dollars in economic output: \$342 million in payroll, 17,680 jobs, and \$67 million in sales and income tax revenue. At over a billion dollars annually, hunting, fishing, and wildlife-associated recreation generates over four times the economic output of the ski and snowboard industry (source: Ski Maine Association) in the State and more than three times the combined sales of Maine's potato and blueberry industries (source: Maine Department of Agriculture). Clearly, Maine's quality of life and its economy are strongly influenced by the diversity and abundance of fish and wildlife that inhabit our state.

ELEMENT 1 – DISTRIBUTION AND ABUNDANCE OF WILDLIFE SPECIES

In this section we discuss the abundance and distribution of Maine's fauna as we know and understand them. For convenience, we address them by taxa, i.e. birds, herpetofauna (reptiles and amphibians), invertebrates, inland fish, mammals (non-marine), and marine wildlife. Based on the best available existing information and guidance provided by the Department of Marine Resources (MDMR) and National Marine Fisheries Service (NMFS), the marine portion of Maine's CWCS focuses attention on listed marine mammals (whales), listed marine turtles, and diadromous fish from the suite of marine species. Outside of these groups, the majority of the species that have active research programs within the Department of Marine Resources are commercially harvested and have management plans and/or regulations in place for conservation purposes or are National Marine Fisheries Service species of concern in the northeast region (Maine through Virginia) and have proactive conservation programs addressing conservation opportunities. With cooperation and guidance from MDMR and NMFS, we will place a high priority on further evaluating the full suite of marine resources for future inclusion in Maine's CWCS.

Birds

Many of Maine's bird species occur statewide in suitable habitat, but others occur only in portions of the state. At least 29 inland breeding species of birds reach the northern limits of their normal breeding distribution in Maine, 28 species the southern limits, and 2 species their eastern limits. Two species (Wild Turkey and Peregrine Falcon) have recently been reintroduced in Maine. The Peregrine Falcon population is slowly increasing, but the Wild Turkey has expanded into areas beyond expectations. Other species, such as the Turkey Vulture, Blue-winged Warbler, Evening Grosbeak, American Oystercatcher, and Great Cormorant have expanded their range into Maine at various times over the past century.

The Golden Eagle, Peregrine Falcon, Piping Plover, Roseate Tern, Least Tern, Black Tern, Sedge Wren, American Pipit, and Grasshopper Sparrow are all on Maine's list of Endangered Species, and the Bald Eagle, Razorbill, Atlantic Puffin, Harlequin Duck, Arctic Tern, and Upland Sandpiper are listed as Threatened. The Roseate Tern and Eskimo Curlew are federally listed as Endangered, and the Bald Eagle and Piping Plover are federally listed as Threatened. The Eskimo Curlew and Common Murre are listed as Extirpated, and the Passenger Pigeon, Great Auk, and Labrador Duck are extinct. Twenty-four species of birds are considered to be species of Special Concern in Maine.

Reptiles and Amphibians

By eastern U.S. standards, Maine is a large and climatically diverse state. Thus, while reptiles and amphibians (herptiles or herpetofauna) are generally richest at southern latitudes, Maine's relatively moderate southern and coastal climate permits a large number of species, especially reptiles, to reach their northeastern range limit in the state. Only one species, the mink frog (*Rana septentrionalis*), reaches the southern edge of its range in Maine (and northern New Hampshire and Vermont). There are 38 species and subspecies of herpetofauna known from Maine, including 9 salamanders, 9 frogs and toads, 8 turtles, and 12 snakes (one is state listed as Extirpated). All of Maine's herptiles are native except the mudpuppy (*Necturus maculosus*).

A relatively large proportion of Maine's reptile fauna (50%) is listed as state Endangered, Threatened, Special Concern, or Extirpated. The Blanding's turtle (*Emys blandingii*), box turtle (*Terrapene carolina*), and black racer (*Coluber constrictor*) are listed as Endangered, and the spotted turtle (*Clemmys guttata*) is listed as Threatened. The wood turtle (*Glyptemys insculpta*), stinkpot (*Sternotherus odoratus*), ribbon snake (*Thamnophis sauritus*), brown snake (*Storeria dekayi*), northern leopard frog (*Rana pipiens*), northern spring salamander (*Gyrinophilus porphyriticus*), and four-toed salamander (*Hemidactylium scutatum*) are all species of Special Concern in Maine, and the timber rattlesnake (*Crotalus horridus*) is listed as Extirpated.

Invertebrates

As is true globally, invertebrates, both in terms of richness and biomass, dominate Maine's biota. It is conservatively estimated that Maine hosts a total of 15,000 non-marine invertebrate species, or nearly 98% of the state's animal species diversity.

The best-studied phyla in Maine are the Mollusca (e.g. snails and mussels; ~200 species) and Arthropoda (e.g. insects, crustaceans, spiders; ~7,950 species). Within these phyla, the state of knowledge on distribution, status, and life history is strongest for just three orders: the Unionoida (freshwater mussels), Odonata (damselflies and dragonflies), and Lepidoptera (butterflies and moths). Other invertebrate taxa also considered because of partial knowledge include Gastropoda (snails; 15 species), Plecoptera (stoneflies; 7 species), Trichoptera (caddisflies; 3 species), Ephemeroptera (mayflies; 22 species), and Coleoptera (beetles; 2 species).

To the best of our knowledge, at least nine invertebrate species are likely extirpated from Maine, including one beetle and eight butterflies and moths. Maine's current Endangered and Threatened Species List includes the Roaring Brook mayfly (*Epeorus frisoni*), ringed boghaunter (*Williamsonia lintneri*), Clayton's copper (*Lycaena dorcas claytoni*), Edwards' hairstreak (*Satyrrium edwardsii*), Hessel's hairstreak (*Callophrys hesseli*) and Katahdin arctic (*Oeneis polixenes katahdin*) as Endangered species, and the tidewater mucket (*Leptodea ochracea*), yellow lampmussel (*Lampsilis cariosa*), Tomah mayfly (*Siphonisca aerodromia*), pygmy snaketail (*Ophiogomphus howei*), twilight moth (*Lycia rachelae*), and pine barrens zanclognatha (*Zanclognatha martha*) as Threatened species. The American burying beetle (*Nicrophorus americanus*) and Karner blue butterfly (*Plebejus melissa samuelis*) are federally listed as Endangered.

Inland Fish

Maine has an abundance of freshwater habitat that support a fishery of some kind. A total of 56 freshwater fish species occur in Maine of which 17 are not indigenous to the state. The list of 56 species does not include fishes that are primarily estuarine, such as the Mummichog (*Fundulus heteroclitus*), nor does it include diadromous fishes such as the searun alewife (*Alosa*

pseudoharengus). However, the list does include the American eel (*Anguilla rostrata*), a catadromous species.

Of the 56 species, 20 are classified as sportfish species regularly pursued by anglers. Fisheries for the other species are of lesser importance, either because they have limited distributions or because of angler preference.

None of Maine's inland fish species are federally Threatened or Endangered, although one, the American eel, is in the early stages of the process to determine the need for a federal listing. The swamp darter (*Etheostoma fusiforme*) is Threatened in Maine. The redfin pickerel (*Esox americanus americanus*), Arctic charr (*Salvelinus alpinus oquassa*), lake trout, and lake whitefish are of concern because of limited or declining distributions and/or population numbers.

Mammals (Non-marine)

Maine has 61 mammalian species not associated with the marine environment. Approximately 12 species of mammals occur in habitats that are rare, and roughly 41% of the mammals are limited in their distribution because they require habitats that are geographically limited in Maine.

Maine's native mammalian fauna has remained fairly intact since losing the sea mink (*Mustela macrodon*), which is now extinct; caribou (*Rangifer tarandus*); eastern cougar (*Felis concolor*); and wolf (*Canis lupus*) roughly 100 years ago. Some mammals, such as the gray fox (*Urocyon cinereoargenteus*) and opossum (*Didelphis virginiana*), have expanded their range into Maine, and others have expanded or contracted their distribution in Maine.

None of Maine's non-marine mammals are listed by Maine as Endangered, and only one is listed as Threatened – the Northern bog lemming (*Synaptomys borealis*). The Canada lynx is a species of Special Concern in Maine (Appendix 10). The gray wolf (*Canis lupus*) and Eastern cougar (*Felis concolor cougar*) are federally listed as Endangered, and the Canada lynx (*Lynx Canadensis*) as Threatened.

Marine Wildlife

There are 2,485 known species of plants and animals in the Gulf of Maine including phytoplankton (310), macrophytes (271), invertebrates (1,414), chordates (37), fishes (252), birds (177), and mammals (24). The Gulf of Maine supports mainly boreal, cold temperate, and non-migratory species.

All federally listed marine mammals and reptiles are on the State list of Endangered and Threatened Marine Species. These include five Endangered whales: northern right whale (*Eubalaena glacialis*), humpback whale (*Megaptera novaeangliae*), finback whale (*Balaenoptera physalus*), sperm whale (*Physeter catodon*), and sei whale, (*Balaenoptera borealis*), two Endangered turtles: leatherback turtle (*Dermochelys coriacea*), Atlantic ridley turtle, also known as Kemp's ridley (*Lepidochelys kempi*), and one state and federally listed Threatened turtle: loggerhead turtle (*Caretta caretta*). The shortnose sturgeon (*Acipenser brevirostrum*) is federally Endangered, as is the Atlantic salmon (*Salmo salar*) in the Gulf of Maine DPS found in eight rivers in the mid-coast and Downeast areas.

Low and Declining Populations

Agency species specialists, with review and input from outside experts and a Public Working Group, examined each species (excepting lesser known invertebrate taxa) in light of specific criteria, and assigned each species to one of four priority categories.

- **Priority 1 (Very High)** = High potential for state extirpation without management intervention and/or protection.
- **Priority 2 (High)** = Moderate to high potential for state extirpation without management intervention and/or protection.
- **Priority 3 (Moderate)** = Low to moderate potential for state extirpation, YET, there are some remaining concerns regarding restricted distribution, status, and/or extreme habitat specialization.
- **Priority 4 (Low)** = Minimal conservation concerns identified at state, regional, or global scales.

Species of Greatest Conservation Need (SGCN)

After reviewing the list of species under each priority, we decided, with the consensus of the Public Working Group, that all Priority 1 and Priority 2 species should be considered Species of Greatest Conservation Need (SGCN). Thus Maine's CWCS identifies 213 SGCN within 6 major taxa (Table 2):

Table 2. Numbers of Maine Wildlife and SGCN.				
Wildlife Taxon	Number	Threatened/ Endangered ¹	Special Concern	SGCN
Birds	292	15	24	103
Herpetofauna	38	4	5	7
Invertebrates	<15,000	12	38	72
Inland Fish	56	1	0	12
Mammals (Non-marine)	59	1	1	6
Marine	1,727 ²	1	0	13
Totals		34	68	213
¹ These species are listed as Endangered or Threatened in Maine.				
² Includes chordates (37 species), marine fishes (252), marine invertebrates (1,414) and marine mammals (24). Marine birds (177) are included in the Bird taxa.				

Because the list of SGCN is long, and anticipated resources are not expected to meet all the conservation needs for those species, we decided to design a triage approach to help us focus our resources. Based on input from the Public Working Group, we decided to make it a two-part process based first on knowledge and readiness, and second on funding need. We consider this process to be dynamic, and we anticipate rankings of SGCN species will change as the status of species change.

ELEMENT 2 – LOCATION AND CONDITIONS OF KEY HABITATS

Physiography

The State of Maine is approximately 21 million acres in size. The Appalachian Mountain chain extends into Maine from New Hampshire, terminating at Mount Katahdin, at 5,268 feet, the state's tallest peak. The western and northwestern borders adjoining New Hampshire and Quebec are characterized by rugged terrain with numerous glacier-scoured peaks, lakes, and valleys. South and east of mountain areas lie rolling hills, smaller mountains, and broad river valleys.

Maine's more than 4,000 mi of coastline consists of long sand beaches interrupted intermittently by rocky promontories in the southwest, and a series of peninsulas, narrow estuaries, bays, fjords, and coves located north and east of Portland, the state's largest city. The tides along Maine's coast are among the highest in the world, running between 12 and 24 feet. More than 4,600 islands dot the coast, and roughly 500 of them support island-nesting wading birds, seabirds, and common eiders. Islands cause upwelling of deep, nutrient-rich water to the sea surface, enriching nearby waters, and thus augmenting the productivity and biodiversity of the coast.

The most pervasive threat to Maine's coastal habitats are permanent structures, many built years ago, such as roads, tide gates, dams, and culverts. These structures can drastically alter tidal flooding and draining, reduce or eliminate access to estuarine habitats by fish and other aquatic organisms, hinder a salt marsh's intrinsic ability to keep pace with sea level rise, and can lead to marsh subsidence (sinking). Up to 25% of Maine's existing salt marsh acreage is compromised by such tidal restrictions.

Despite state and local coastal wetland regulations, alterations in and around wetlands continue to degrade coastal wetland functions and values. Inconsistent implementation and enforcement of Maine's Mandatory Shoreland Zoning Law, and a lack of data on the impacts of marsh filling, tidal restriction, and development within the coastal wetland and adjacent buffer, are in part, hampering effective protection and restoration efforts.

Maine has more than 5,000 rivers and streams comprising 31,800 miles of flowing waters that provide nearly half of the watershed for the Gulf of Maine. More of Maine's rivers and streams are undeveloped and free flowing than in any other state in the northeastern United States. The state's major rivers include the Penobscot (350 mi), the St. John (211 mi), the Androscoggin (175 mi), the Kennebec (150 mi), the Saco (104 mi), and the St. Croix (75 mi).

Despite great improvements in water quality in Maine's larger rivers since the passage of the original Clean Water Act, our understanding of the dynamics of these ecosystems is rudimentary. Free-flowing rivers, in particular, are considered threatened throughout much of northern North America.

Maine also boasts more than 5,600 lakes and ponds. In fact, the state has the second largest number of natural glaciated lakes of any state east of the Mississippi River. Of Maine's more than 5,600 lakes and ponds, 2,314 are deemed "significant" and are regularly evaluated by the Maine Department of Environmental Protection.

An assessment of water quality in Maine lakes found 203 lakes in Maine to be "impaired" in their ability to support native aquatic life. Algal blooms from human-caused eutrophication are

becoming annual occurrences in some southern Maine lakes; at least 54 lakes in Maine have experienced substantial eutrophication.

Wetlands account for 25-30% of the surface area of Maine, four times the wetland area of the other five New England States combined. Over 5 million acres of Maine's wetlands are freshwater types (wooded swamps, shrub swamps, bogs, freshwater meadows, freshwater marshes, peatlands and floodplains).

Wetland losses in Maine (~20%) have been less severe than in the nation as a whole, which has lost over one-half of wetlands that existed prior to European settlement. Wetland losses in Maine have been attributed to draining and filling for residential and commercial development, and flooding.

In general, Maine's freshwater ecosystems are threatened by non-point source pollution from land use activities over a broad area, and their impacts are likewise diffuse. Similarly, point-source pollutants, those discharged directly from a pipe or sewer, are known to contribute to water quality concerns. Also, the spread of invasive aquatic species (e.g. non-native milfoils, etc.) in Maine waters is one of the greatest environmental challenges of our time. Nonetheless, the quality of Maine waters has improved substantially in the past 20 years.

Maine falls in the transition between the deciduous forest region to the south and the boreal forest region to the north. Maine's forests cover more than 17 million acres, giving the state the distinction of being the most heavily forested state in the nation. Although Maine is the most heavily forested state in the nation, it also contains some of the most significant grassland and agricultural lands in the Northeast. Unlike some areas, such as the Midwest – where forest cover has been almost completely lost due to conversion to agriculture or other uses – Maine retains, or has regrown, much of its forest cover.

Climate

Mean temperatures in Maine are about 62°F throughout the state during the summer and 20°F during the winter. Clear days range from about 100 per year in the south to only 70 in the north, and annual precipitation averages 36 to 48 inches. Snowfall averages 71 inches in the south and more than 100 inches in the north and higher elevations.

Land Use

The vast majority of the state (90%) is characterized as nonfederal rural lands, referring to all lands in private, municipal, state, or tribal ownership. Of the 19,505,900 acres of nonfederal land in Maine, 17,691,100 (91%) are classified as forestland. Developed land, cropland, and pastureland comprise nearly 4%, 2%, and less than 1% of nonfederal lands in the State respectively.

Conservation Land in Maine

According to the best available data, there are 3,087,100 acres of conservation land in Maine, accounting for less than 15% of the State. This conservation land includes parcels with a variety of restrictions, including "working forest" conservation easements, public lands managed for multiple uses, private conservation lands, state Ecological Reserves, and others. The Maine Department of Inland Fisheries and Wildlife (MDIFW) holds title to approximately 106,000 acres on 54 Wildlife Management Areas (WMA).

Ecoregions

Maine has identified eight Ecoregions that serve as an effective coarse-filter approach for inventorying and assessing the state's resources and setting regional conservation goals. However, a finer level of precision is required for many conservation actions identified in this Strategy. Therefore, Maine's CWCS recognizes 21 key habitat types within three major ecosystems (Coastal, Freshwater, and Upland) for conservation purposes (Table 3).

Table 3. Ecosystems and 21 Key Habitats.	
Coastal (C)	
Marine Open Water (CO)	
Estuaries and Bays (CE)	
Rocky Coastline and islands (CC)	
Unconsolidated Shore (beaches and mudflats) (CU)	
Estuarine Emergent Saltmarsh (CS)	
Freshwater Wetlands (W)	
Freshwater Lakes and Ponds (WL)*	
Emergent Marsh and Wet Meadows (WM)	
Forested Wetland (WF)	
Shrub-scrub Wetland (WS)	
Peatlands (WP)	
Rivers and Streams (WR)*	
*Combined for Birds	
Upland (U)	
Deciduous and Mixed Forest (UD)	
Coniferous Forest (UC)	
Dry Woodland and Barrens (<60% canopy cover) (UB)	
Mountaintop Forest (incl. krummholz) (UM)	
Alpine (summits & tablelands above treeline) (UA)	
Shrub / Early Successional (incl. regenerating forest) (US)	
Grassland / Agricultural / Old Field (shrubs <50%) (UG)	
Urban / Suburban (UU)	
Cliff face and Rocky Outcrop (incl. talus) (UR)	
Caves and Mines (UCM)	

Based on the 21 key habitat types, MDIFW and MDMR staff, in consultation with species experts and stakeholders, identified the primary and secondary habitats important to the lifecycle of each of Maine's 213 SGCN species. Of the primary habitats identified for SGCN species, freshwater habitats accounted for 39%, upland habitats 37%, and coastal habitats 24%. Primary habitats for SGCN birds accounted for 72% of the coastal primary habitats, invertebrates 52% of the freshwater, and birds 59% of the upland primary habitats.

If we examine primary habitats by taxa, we find that 45% of the primary habitats for SGCN birds are in coastal habitats, all primary habitats for SGCN herpetofauna and inland fish are in freshwater habitats, 63% of primary habitats for SGCN invertebrates are in freshwater habitats, 83% of primary habitats for non-marine SGCN mammals are in upland habitats, and 72% of the primary habitats for SGCN marine species are in coastal habitats. Of the 21 habitat types we identified, rivers and streams account for 14% of the SGCN primary habitats, followed by lakes and ponds

(12%), and rocky coastline and islands (9%). Essentially all 21 habitats, except caves and mines, serve as primary habitats for at least one SGCN species, and all serve as secondary habitats for at least one SGCN species.

Species-at-risk Focus Areas

Southern and coastal Maine has the highest level of plant and animal diversity in the state. Unfortunately, this area is one of the most desirable for development, and increasing development is leading to habitat fragmentation and loss. In response to this loss, MDIFW and Maine Natural Areas Program (MNAP) have undertaken systematic surveys of high value habitats supporting rare species and high quality natural communities in this region. Using data from this inventory work and from other sources, biologists at MNAP, MDIFW, and The Nature Conservancy (TNC) evaluated the landscape and identified areas with the highest concentrations of rare species and high quality habitats. The result of this effort is a mapped suite of 93 species-at-risk Focus Areas. For each species-at-risk Focus Area there is a basic conservation plan that includes descriptions of significant features, recommendations for how best to protect those resources, and a map that delimits the area and shows locations of rare species and high quality habitats. Criteria used to delineate focus areas include locations of rare plants, animals, and natural communities; locations of the best examples of common natural communities; locations of significant wildlife habitats; and locations where these features overlapped with larger undeveloped blocks.

ELEMENT 3 – PROBLEMS THAT MAY ADVERSELY AFFECT SPECIES AND HABITATS

In this element, we outline how we recognize problems and threats to SGCN, and how we identify conservation actions needed to address those problems and threats. We did this by developing tables for each broad species group: Birds, Herpetofauna, Invertebrates, Inland Fish, and Mammals. For the Marine group, we developed a table only for diadromous fish. We focused our efforts on Priority 1 and Priority 2 SGCN for all taxa. However, for the bird, herpetofauna, invertebrate, and mammal taxa, we also included Priority 3 species (not SGCN) for future planning and to help partners understand where the species they are most concerned about fit into the relative conservation scheme.

Each table is organized by ecosystems (Coastal, Freshwater, and Upland), and by the 21 key habitats within each ecosystem. We address each primary habitat separately, and under each primary habitat we include:

1. A list of Priority 1-3 species associated with that habitat (Priority 3 species not included for inland and diadromous fish);
2. A description of threats to that habitat;
3. A management goal and general objectives for that habitat;
4. Strategies and tasks to address objectives for that habitat and the species associated with it; and
5. A section that describes the following for each SGCN for which that habitat serves as the species primary habitat:
 - Status of the SGCN species;
 - Distribution of the species;
 - Threats to the species;

- Population and habitat objectives and actions for the species, which includes management actions, surveys, and monitoring; and
- Research and outreach objectives and actions for the species, which includes conservation actions.

Information used to populate these tables came from a wide variety of sources. For threats specific to SGCN species and their habitats, we consulted international, national, regional, and state plans and initiatives. We also consulted our knowledge base of threats that was compiled through our comprehensive species planning process. We also acknowledge that the species experts who compiled these tables, have, through years of experience and accumulated knowledge, become very familiar with the threats facing the species they work with. Finally, members of the CWCS Public Working Group were given the opportunity to critique these tables and provide further input, which several chose to do.

Because of the complexity of species-specific habitat threats, we did not attempt to summarize and discuss all threats, but refer the reader to the tables mentioned above. However, for ease of reference, we developed another table that summarizes the threats and potential threats to the 21 habitats used throughout this document, including threats that are common to more than one habitat type (e.g. climate change, pollution, development, contaminants, etc.), and threats that are unique to a particular habitat. Threats to the habitats were identified based on their potential effect on SGCN. Threats such as disturbance from human activity are included under species-specific threats and not under threats to the habitat. None of the lists are comprehensive, but they are designed to serve as an indicator of the scope of threats and potential threats that are affecting, or may affect, each habitat.

ELEMENT 4 – CONSERVATION ACTIONS TO CONSERVE SPECIES AND HABITATS

Conservation actions described in this element will serve as a solid foundation for the future of wildlife conservation, and will help guide collaborative efforts of state and federal agencies, tribes, conservation partners, and individuals to ensure success. However, Maine's CWCS is not a fixed set of conservation objectives and strategies. Rather, the CWCS is a series of processes that can be used to identify Department and partner priorities from the individual species to the landscape level. It is a process that is dynamic, responsive, and adaptive.

Based on the hundreds of potential conservation actions and opportunities, which addresses threats, challenges, and needs in Maine, we identified five broad program components, super strategies if you will, that address **five** major categories of threats and needs synthesized from those identified in Element 3 (Table 4). These include:

1. **Surveys and Monitoring** – Addresses data gaps and informational needs on the distribution, abundance, and status of SGCN;
2. **Research** – Addresses gaps in our understanding of life history, productivity, mortality, habitat requirements, limiting factors, interactions with other species, and conservation needs of priority species;
3. **Population Management** – Addresses acute population threats (e.g., take, excessive mortality);

4. **Habitat Conservation**¹ – Addresses threats to SGCN habitat due to alteration and degradation, conversion, fragmentation, introduction of invasive species and exotics, pollution, etc.; and
5. **Education and Outreach** – Addresses the public's lack of understanding of the needs and requirements of SGCN, and the need to raise the public's awareness of the threats to SGCN and their habitats.

Inherent within each program component is a level of program supervision, coordination, and administration (planning, goal setting, evaluation, monitoring, and budgeting) necessary to ensure completion of conservation actions.

A relational database will be developed later in 2005 to help identify opportunities for conservation actions that will benefit the most SGCN and their habitats and bring the “biggest bang for the buck.” In the interim, however, in order to assess priorities across taxa and key habitats, MDIFW and MDMR staff, in consultation with species experts and stakeholders, identified the two highest priority conservation super strategies for each SGCN within the primary habitat in which they occur. This level of organization is not meant to supersede the conservation actions identified for individual species or habitats. Rather, it is a broader-scale approach to synthesizing needs that will address the most species and threats and yield the highest conservation return.

Table 4. General conservation strategies for Maine's CWCS organized within 5 program components. Species-specific strategies are presented in Chapter 5, Tables 30-35. Strategies are provided as examples, do not constitute an exhaustive list, and are <u>not</u> presented in order of priority.	
Program Components	General Conservation Strategy
Surveys & Monitoring	Conduct systematic, statewide surveys to document distribution and abundance of SGCN in the ecoregions of Maine.
	Compile and map element occurrence data for SGCN.
	Assess population size, viability, and habitat extent for priority species at known occurrence(s).
	Monitor SGCN to determine population size, status, and trends. Coordinate monitoring objectives and methods with regional partners.
	Investigate reports of SGCN occurrence to determine validity.
Research	Conduct applied research to investigate life history, productivity, mortality, habitat requirements, limiting factors, interactions with other species, and conservation needs of priority species.
	Combine field survey and applied research to identify specific characteristics of habitats important to priority species.
	Investigate existing and potential threats to determine population level effects on priority species.
	Coordinate research objectives with state and regional partners.
Population Management	Consider intensive population management as a means of enhancing survival and/or recruitment of priority species.
	Work with state and national partners to implement pilot projects addressing population enhancement at select focus areas.

¹ Habitat-specific actions are described when habitat could be a limiting factor for a species. General habitat protection is provided for all species through landscape level habitat conservation.

Table 4. General conservation strategies for Maine's CWCS organized within 5 program components. Species-specific strategies are presented in Chapter 5, Tables 30-35. Strategies are provided as examples, do not constitute an exhaustive list, and are <u>not</u> presented in order of priority.	
Program Components	General Conservation Strategy
Population Management (continued)	Consider site-specific, intensive population management and recovery measures for rare species threatened by imminent extirpation.
	Implement and enforce environmental rules and laws that affect survival of priority species.
	Actively deter, reduce, or eliminate predators impacting populations of priority species.
	Develop effective mitigation and relocation protocols for projects displacing priority species and conduct long-term post-monitoring of impacted populations to determine efficacy of mitigation and relocation techniques.
	Promulgate and evaluate hunting and fishing regulations that control harvest and sustain populations.
	Develop and implement rehabilitation programs for priority sport fisheries that have declined.
Habitat Conservation	Implement landscape level habitat conservation initiatives.
	Develop regulatory habitat protection provisions for projects under the Maine Endangered Species Act (MESA) and other regulations protecting Maine's wildlife [e.g. Natural Resources Protection Act (NRPA), Site Location Law].
	Develop consistent regulatory habitat protection standards for projects subject to review under the MESA and NRPA.
	Support enforcement of existing environmental laws to protect key habitats.
	Develop nonregulatory habitat management guidelines for priority habitats and species for distribution to landowners, land managers, towns, land trusts, and others.
	Cooperate with TNC, NRCS, landowners, local land trusts, municipalities, and other partners to conserve habitat for priority species using fee acquisition, conservation easements, purchase of development rights, incentives, cooperative management agreements, management plans, improved comprehensive planning, habitat restoration and enhancements, and other conservation tools.
	Identify existing and potential threats to habitats for priority species and consider restorative measures to improve habitat integrity.
	Develop and monitor the implementation of specific conservation actions.
Education and Outreach	Increase public awareness of threats and concerns of priority species using print, media, website, etc.
	Implement existing and new public outreach efforts to promote an understanding and awareness of, and gain support for priority species and their habitats.
	Support and assist in implementing surveys to assess attitudes and knowledge of specific wildlife resources in Maine's CWCS.

Table 5. Two Highest Program Components (Super Strategies) Needed by Maine's SGCN.
 (Sorted by primary habitat in which each SGCN occurs¹)

Habitat / Species	Surveys / Monitoring	Research	Population Management	Habitat Conservation ²	Education & Outreach
Coastal					
Marine Open Waters (CO)					
American Shad	X			X	
Atlantic Ridley	X				X
Atlantic Salmon	X	X			
Atlantic Sturgeon	X			X	
Finback Whale	X				X
Greater Shearwater	X	X			
Humpback Whale	X				X
Leatherback	X				X
Loggerhead	X				X
Northern Right Whale	X				X
Red-necked Phalarope	X	X			
Sei Whale	X				X
Sperm Whale	X				X
Striped Bass	X	X			
Estuaries and Bays (CE)					
American Black Duck (Wintering Population)			X	X	
Common Eider (Molting and Wintering Birds)		X	X		
Common Loon (Wintering and Non-breeding)			X		X
Greater Scaup (Non-breeding)	X		X		
Ruddy Duck	X		X		
Shortnose Sturgeon	X			X	
Rocky Coastline and Islands (CC)					
American Oystercatcher	X			X	
Arctic Tern	X		X		
Atlantic Puffin	X		X		
Bald Eagle	X			X	
Cattle Egret	X		X		
Common Eider (Breeding Population Only)	X	X			
Common Murre	X		X		
Common Tern	X		X		
Glossy Ibis	X		X		
Great Cormorant	X		X		
Great Egret	X		X		
Harlequin Duck	X				X
Little Blue Heron	X		X		
Penobscot Meadow Vole	X	X			
Purple Sandpiper	X	X			
Razorbill	X		X		
Roseate Tern	X		X		
Ruddy Turnstone	X			X	

Table 5. Two Highest Program Components (Super Strategies) Needed by Maine's SGCN.
 (Sorted by primary habitat in which each SGCN occurs¹)

Habitat / Species	Surveys / Monitoring	Research	Population Management	Habitat Conservation ²	Education & Outreach
Snowy Egret	X		X		
Tri-colored Heron	X		X		
Unconsolidated Shore (CU)					
Great Blue Heron	X			X	
Greater Yellowlegs	X			X	
Least Tern			X	X	
Piping Plover			X	X	
Red Knot	X			X	
Sanderling	X			X	
Semipalmated Sandpiper	X			X	
Whimbrel	X			X	
Estuarine Emergent Salt Marsh (CS)					
Black-crowned Night Heron	X		X		
Citrine Forktail <i>Ischnura hastata</i>	X				X
Nelson's Sharp-tailed Sparrow	X	X			
Saltmarsh Sharp-tailed Sparrow	X	X			
Willet	X			X	
Freshwater					
Lakes and Ponds (WL)					
American Eel	X	X			
Arctic Charr			X	X	
Barn Swallow			X	X	
Big Bluet <i>Enallagma durum</i>	X			X	
Bigmouth Pondsnail <i>Stagnicola mighelsi</i>	X				X
Bonaparte's Gull (Breeding)	X				
Brook Trout	X	X			
Burbot (Cusk)	X	X			
Common Loon (Breeding)			X	X	
Dusky Dancer <i>Argia translata</i>	X				X
Great Lakes Physa <i>Physella magnalacustris</i>	X				X
Lake Trout (Togue)			X	X	
Lake Whitefish		X		X	
Landlocked Salmon			X	X	
Longnose Sucker	X	X			
A Mayfly <i>Siphonurus demaryi</i>	X				X
A Mayfly <i>Siphonurus securifer</i>	X				X
Pied-billed Grebe	X	X			
Rainbow Smelt		X	X		

Table 5. Two Highest Program Components (Super Strategies) Needed by Maine's SGCN.
(Sorted by primary habitat in which each SGCN occurs¹)

Habitat / Species	Surveys / Monitoring	Research	Population Management	Habitat Conservation ²	Education & Outreach
Rambur's Forktail <i>Ischnura ramburii</i>	X				X
Round Whitefish	X	X			
Scarlet Bluet <i>Enallagma pictum</i>	X	X			
Spatterdock Darner <i>Rhionaeschna mutata</i>	X		X		
Swamp Darter		X		X	
Tidewater Mucket <i>Leptodea ochracea</i>		X	X		
Tule Bluet <i>Enallagma carunculatum</i>	X				X
Emergent Marsh and Wet Meadows (WM)					
American Bittern	X	X			
American Black Duck (Breeding Population)			X	X	
American Coot	X	X			
Black Tern	X			X	
Common Moorhen	X	X			
Least Bittern	X	X			
Marsh Wren	X	X			
Purple Martin	X		X		
Sandhill Crane	X				
Sedge Darner <i>Aeshna juncea</i>	X				X
Sedge Wren	X	X			
Yellow Rail	X				
Forested Wetland (WF)					
Hessel's Hairstreak <i>Callophrys hesseli</i>			X	X	
Precious Underwing <i>Catocala p. pretiosa</i>	X				X
Swamp Darner <i>Epieaeschna heros</i>	X				X
Shrub-scrub Wetlands (WS)					
Blanding's Turtle		X		X	
Blue-spotted Salamander		X			X
Ringed Boghaunter <i>Williamsonia lintneri</i>	X			X	
Rusty Blackbird	X	X			
Spotted Turtle	X			X	
Willow Flycatcher	X	X			
Peatlands (WP)					
Canada Whiteface <i>Leucorrhinia patricia</i>	X				X
Clayton's Copper <i>Lycaena dorcas claytoni</i>			X	X	

Table 5. Two Highest Program Components (Super Strategies) Needed by Maine's SGCN.
 (Sorted by primary habitat in which each SGCN occurs¹)

Habitat / Species	Surveys / Monitoring	Research	Population Management	Habitat Conservation ²	Education & Outreach
Crowberry Blue <i>Plebejus idas empetri</i>				X	X
Deep-Throat Vertigo <i>Vertigo nylanderii</i>	X				X
Frigga Fritillary <i>Boloria frigga</i>	X			X	
Pleistocene Catinella <i>Catinella exile</i>	X				X
Quebec Emerald <i>Somatochlora brevicincta</i>	X				X
Six-whorl Vertigo <i>Vertigo morsei</i>	X				X
Rivers and Streams (WR)					
American Eel	X	X			
American Shad	X			X	
Arrow Clubtail <i>Stylurus spiniceps</i>	X			X	
Arrowhead Spiketail <i>Cordulegaster obliqua</i>	X				X
Atlantic Salmon	X	X			
Atlantic Sturgeon	X			X	
Barrow's Goldeneye		X	X		
Boreal Snaketail <i>Ophiogomphus colubrinus</i>	X				X
Brook Floater <i>Alasmodonta varicosa</i>			X	X	
A Caddisfly <i>Hydroptila tomah</i>	X				X
Cobra Clubtail <i>Gomphus vastus</i>	X			X	
Louisiana Waterthrush	X			X	
A Mayfly <i>Baetisca rubescens</i>	X				X
A Mayfly <i>Nixe horrida</i>	X				X
A Mayfly <i>Nixe rusticalis</i>	X				X
A Mayfly <i>Plauditus veteris</i>	X				X
A Mayfly <i>Proclleon mendax</i>	X				X
A Mayfly <i>Proclleon ozburni</i>	X				X
A Mayfly <i>Proclleon simplex</i>	X				X
Pygmy Snaketail <i>Ophiogomphus howei</i>	X			X	

Table 5. Two Highest Program Components (Super Strategies) Needed by Maine's SGCN.
 (Sorted by primary habitat in which each SGCN occurs¹)

Habitat / Species	Surveys / Monitoring	Research	Population Management	Habitat Conservation ²	Education & Outreach
Rapids Clubtail <i>Gomphus quadricolor</i>	X			X	
Redfin Pickerel		X		X	
Roaring Brook Mayfly <i>Epeorus frisoni</i>	X				X
Shortnose Sturgeon	X			X	
Southern Pygmy Clubtail <i>Lanthus vernalis</i>	X				X
A Spire Snail <i>Amnicola decisus</i>	X				X
A Stonefly <i>Neoperla mainensis</i>	X				X
Striped Bass	X	X			
Tomah Mayfly <i>Siphonisca aerodromia</i>	X			X	
Wood Turtle				X	X
Yellow Lampmussel <i>Lampsilis cariosa</i>		X	X		
Yellow-throated Vireo	X	X			
UPLAND					
Deciduous and Mixed Forest (UD)					
American Burying Beetle <i>Nicrophorus americanus</i>	X				X
Baltimore Oriole		X		X	
Black and White Warbler		X		X	
Black-billed Cuckoo		X		X	
Black-throated Blue Warbler		X		X	
Black-throated Green Warbler		X		X	
Canada Warbler		X		X	
Early Hairstreak <i>Erora laeta</i>	X				X
Eastern Box Turtle	X				X
Eastern Screech Owl	X	X			
Great-crested Flycatcher		X		X	
Lamellate Supercoil <i>Paravitrea lamellidens</i>	X				X
Mystery Vertigo <i>Vertigo paradoxa</i>	X				X
Northern Flicker		X		X	
Northern Parula		X		X	
Rose-breasted Grosbeak		X		X	
Scarlet Tanager		X		X	
Spicebush Swallowtail <i>Papilio troilus</i>	X				X
Veery		X		X	
Wood Thrush		X		X	

Table 5. Two Highest Program Components (Super Strategies) Needed by Maine's SGCN.
 (Sorted by primary habitat in which each SGCN occurs¹)

Habitat / Species	Surveys / Monitoring	Research	Population Management	Habitat Conservation ²	Education & Outreach
Yellow-bellied Sapsucker		X		X	
Coniferous Forest (UC)					
American Three-toed Woodpecker	X	X			
Barred Owl		X	X		
Bay-breasted Warbler		X		X	
Blackburnian Warbler		X		X	
Cape May Warbler		X		X	
Long-eared Owl	X	X			
Olive-sided Flycatcher	X	X			
Pine Devil <i>Citheronia sepulcralis</i>	X				X
Purple Finch		X		X	
Purple Lesser Fritillary <i>Boloria chariclea grandis</i>	X			X	
Red Crossbill		X		X	
Dry Woodland and Barrens (UB)					
Barrens Itame <i>Itame sp. 1</i>	X			X	
The Buckmoth <i>Hemileuca m. maia</i>	X			X	
Edward's Hairstreak <i>Satyrus edwardsii</i>	X			X	
Graceful Clearwing <i>Hemaris gracilis</i>	X				X
A Moth <i>Cucullia speyeri</i>	X			X	
A Moth <i>Nepytia pellucidaria</i>	X				X
A Noctuid Moth <i>Chaetagnathia cerata</i>	X			X	
Northern Black Racer	X	X			
Pine Barrens Zale <i>Zale sp. 1 nr. lunifera</i>	X			X	
Pine Barrens Zanclognatha <i>Zanclognatha martha</i>	X			X	
Pine Pinion <i>Lithophane l. lepida</i>	X				X
Pink Sallow <i>Psectraglaea carnosus</i>	X			X	
Prairie Warbler		X		X	
Sleepy Duskywing <i>Erynnis brizo</i>	X				X
Twilight Moth <i>Lycia rachelae</i>	X			X	
Upland Sandpiper		X		X	
Vesper Sparrow		X		X	

Table 5. Two Highest Program Components (Super Strategies) Needed by Maine's SGCN.
(Sorted by primary habitat in which each SGCN occurs¹)

Habitat / Species	Surveys / Monitoring	Research	Population Management	Habitat Conservation ²	Education & Outreach
Mountaintop Forest (UM)					
Bicknell's Thrush	X			X	
Northern Bog Lemming	X	X			
Alpine (UA)					
American Pipit (Breeding)	X			X	
Katahdin Arctic <i>Oeneis polixenes katahdin</i>	X		X		
Shrub / Early Successional (US)					
American Woodcock	X			X	
Blue-gray Gnatcatcher	X	X			
Blue-winged Warbler	X	X			
Brown Thrasher		X		X	
Canada Lynx		X			X
Chestnut-sided Warbler		X		X	
Common Nighthawk		X		X	
Eastern Kingbird		X		X	
Eastern Towhee		X		X	
Loggerhead Shrike	X				
New England Cottontail			X	X	
Whip-poor-will	X	X			
Wolf	X				X
Grassland / Agriculture / Old Fields (UG)					
Bobolink		X		X	
Cobweb Skipper <i>Hesperia metea</i>	X			X	
Coral Hairstreak <i>Satyrus titus</i>	X			X	
Eastern Meadowlark		X		X	
Field Sparrow		X		X	
Grasshopper Sparrow	X			X	
Greenish Blue <i>Plebejus saepiolus amica</i>	X				X
Horned Lark (Breeding)	X	X			
Juniper Hairstreak <i>Callophrys gryneus</i>	X			X	
Leonard's Skipper <i>Hesperia leonardus</i>	X			X	
Short-eared Owl	X			X	
Urban/Suburban (UU)					
Chimney Swift		X		X	
Cliff Face and Rocky Outcrop (UR)					
Eastern Small-footed Myotis	X	X			
Golden Eagle	X			X	
Peregrine Falcon			X	X	

Table 5. Two Highest Program Components (Super Strategies) Needed by Maine's SGCN.
(Sorted by primary habitat in which each SGCN occurs¹)

Habitat / Species	Surveys / Monitoring	Research	Population Management	Habitat Conservation ²	Education & Outreach
Timber Rattlesnake	X				X
Caves and Mines (UCM) ³					

¹ We included diadromous species in each of the primary habitats in which they occur, but for summary purpose, counted them once.
² We assume that all species need and will benefit from landscape level habitat conservation as a high priority. Habitat Conservation in this instance refers to species-specific habitat conservation actions when habitat could be a limiting factor for a species.
³ Not a primary habitat for any SGCN.

Process for Conserving Maine's SGCN

Historically, wildlife conservation efforts have tended to focus on single species. Other conservation efforts identify and protect areas of land (focus areas) that contain diverse assemblages of at-risk wildlife species. However, as we continue to change our landscape, species-by-species and focus-area conservation approaches, while both laudable, may not be the most effective means to conserve biodiversity, and they do little to ensure the continued well-being of more common species also under Department stewardship. Landscape-level conservation that addresses the needs of many species by conserving the underlying resources upon which they depend, may be a more productive way to use limited resources to benefit the greatest number of species and address the full array of wildlife in Maine.

To prevent further impacts to wildlife, and to more effectively use available conservation resources, Maine has developed a process designed to conserve SGCN on a landscape scale. This landscape approach benefits many species, but it also allows for species-specific actions needed to ensure the well-being of species with specific needs not necessarily met by more generalized strategies (Figure 1). Maine's coarse filter/fine filter approach for conserving SGCN builds on a species planning effort ongoing in the state since 1968; a series of ecoregional surveys of rare, Threatened, and Endangered animal and plant communities in progress since the late 1990s; a landscape approach to habitat conservation - *Beginning with Habitat* - initiated in 2000; and a long history of public involvement and collaboration among conservation partners. This process addresses both tenets of the State Wildlife Grant Program: it benefits Species of Greatest Conservation Need while keeping common species common.

The first step in the process to conserve Maine's SGCN asks the question "Do we have adequate knowledge to develop conservation actions meant to benefit a single species or group of species?" (Box 1 of Figure 1). If adequate knowledge concerning the biology, habitat requirements, distribution, and population status for a species or species group exists, the species is taken through MDIFW's comprehensive species planning process.

The comprehensive species planning process currently being used in Maine involves 2 major parts, each with 2 steps. Part 1 includes compiling species assessments, which serve as the basis for the rest of the planning process, and developing publicly derived species management goals and objectives. Since 1985, the Department has prepared 61 species assessments, including 54 individual species assessments and 7 assessments for groups of species. In total, the assessments encompass 279 species, 90 of these are SGCN. Also, 30 assessments have received major updates at least once since 1986.

Part 2 includes producing species management systems and developing jobs for the Department's operational plan to implement each management system. Since 1985, MDIFW has prepared 26 management systems encompassing 247 species, 72 of these are SGCN. This species focus approach is depicted in Boxes 2-10 and 14 of Figure 1.

If adequate knowledge does not exist to develop species-specific conservation actions, the right side of Figure 1 allows for opportunities to conduct surveys and monitoring (Box 11 of Figure 1); research to obtain information necessary to take a species or species group through MDIFW's comprehensive species planning process (Box 12 of Figure 1); education and outreach efforts to address the public's lack of understanding of the needs and requirements of SGCN, and the need to raise the public's awareness of the threats to SGCN and their habitats (Box 13 of Figure 1); while at the same time conserving species and their habitats with landscape level conservation actions - *Beginning with Habitat* - meant to benefit a large number of species both vulnerable and common (Box 14 of Figure 1).

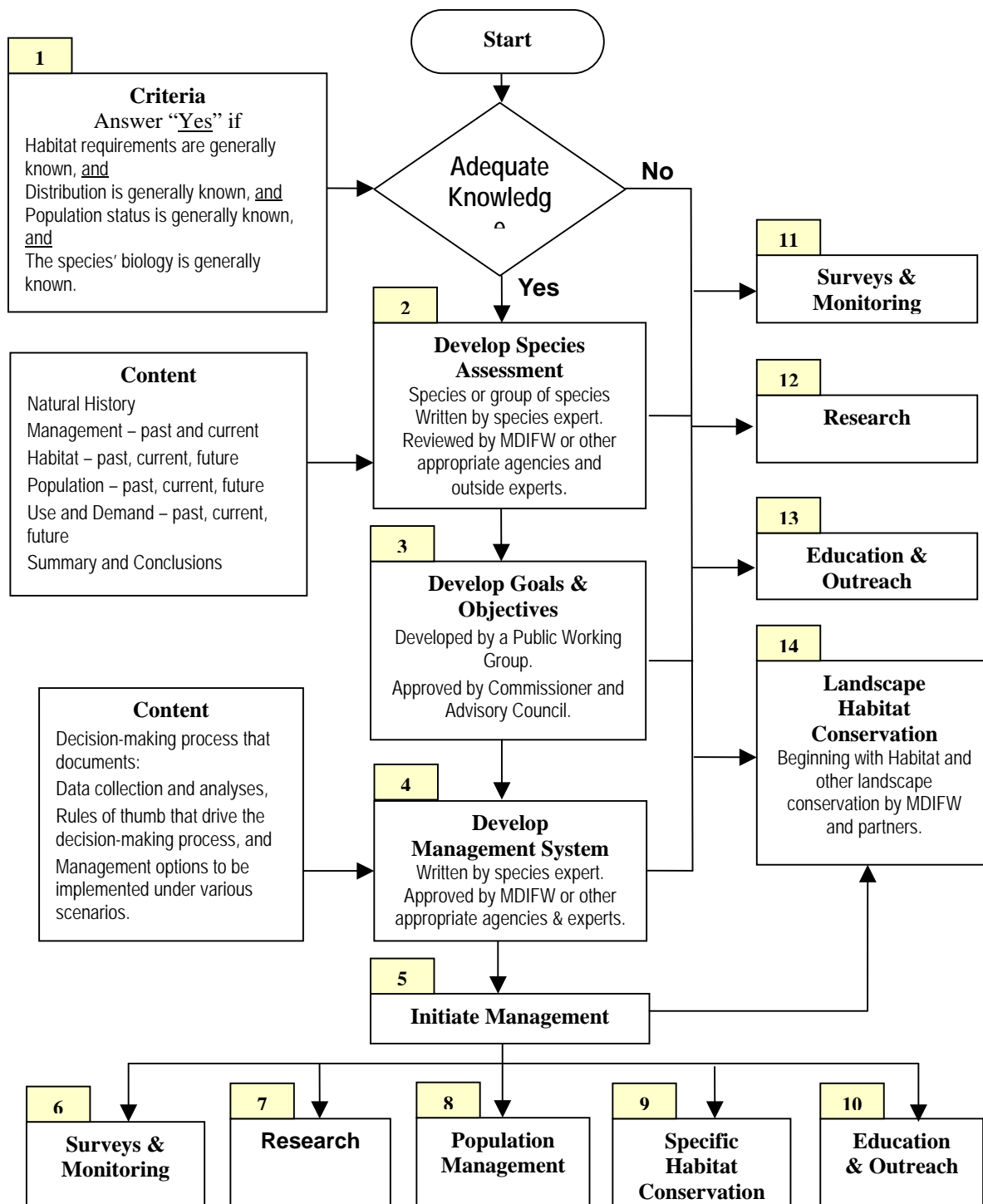
Beginning with Habitat (BwH) embodies a fundamental change in the way that state and federal agencies approach wildlife habitat conservation. It is a habitat-based model that provides the information to cooperatively create a landscape with local decision-makers that will support all breeding species of Maine's wildlife into the future. Often, the ability of the landscape to support wildlife is eroded by the impacts of unplanned, sprawling development. *Beginning with Habitat* takes habitat data from multiple sources, integrates it into one package, and makes it accessible to communities to use pro-actively. *Beginning with Habitat* partners can then work with communities to design a landscape that accommodates the growth they need with resource conservation, by creating a functional landscape based on habitat needs of species that are present. The program is designed to help towns create a vision for their future that includes maintaining the ability of their landscape to support all wildlife 100 years from now.

The *Beginning with Habitat* program provides municipalities, land trusts, and other organizations engaged in habitat conservation with maps of habitat data and conservation recommendations in three primary areas:

1. **Riparian Habitats**
2. **High Value Plant and Animal Habitats (including Federal trust species)**
3. **Large, Undeveloped Habitat Blocks**

These core maps, together with supplemental maps showing public and conservation lands, watersheds, and species-at-risk focus areas, are used to build a system of interconnected and conserved lands to promote habitat conservation for Maine's diverse assemblage of wildlife and plants, including rare and endangered species.

Beginning with Habitat seeks to achieve habitat conservation for rare and endangered species by working cooperatively with willing public and private landowners; it is not a regulatory, land-use zoning mechanism. The success of *Beginning with Habitat* depends largely on voluntary land conservation efforts by landowners, particularly private landowners. These habitat conservation efforts involve conservation easements, cooperative management agreements, and other tools. The availability of meaningful incentives is critical to long-term stewardship by the private landowner. If continued development of Maine is done thoughtfully, it will be located in appropriate areas, and open space will be maintained for fish, wildlife, and plant habitat; farming and forestry opportunities; as well as outdoor recreation.

Figure 1. Maine's Process for Conserving Species of Greatest Conservation Need.

NOTE: The above outlines how Maine will conserve SGCN species. However, a time may come when emergency population management and habitat conservation measures may be needed for a species that has not been through the planning process. These emergencies will be addressed as they arise.

This CWCS addresses species in greatest need of conservation for which no dedicated, stable, flexible, or responsive conservation program exists. There is a wealth of information on priority species and their needs. The value of this CWCS extends far beyond the requirements and funding of the State Wildlife Grant program and beyond the missions of MDIFW, MDMR, and Maine Atlantic Salmon Commission (MASC). Indeed, this is a historic opportunity and challenge for these agencies and their conservation partners to provide effective and visionary leadership in conservation of all wildlife occurring in Maine. To be effective, we must build a program that is stable, opportunistic, flexible, transparent, inclusive, and one that capitalizes on partnerships.

A program must also address the greatest number of the most critical conservation needs, and be flexible enough to adapt to changing needs and be able to respond to opportunities for collaboration among partners. Since current available funding is insufficient relative to the conservation need, we must prioritize conservation actions in order to stretch limited funds to yield the highest conservation return. We chose not to prioritize the hundreds of conservation actions we identified in Chapter 5, but instead developed a process to prioritize actions that was dynamic and responsive.

Table 5 identifies SGCN by habitat type and identifies the two highest priority conservation actions among the five in our CWCS (Surveys and Monitoring, Research, Population Management, Habitat Conservation, and Education and Outreach). This table allows us to evaluate relationships between habitats, species, and conservation actions. The conservation priorities in Table 5 will change as new information becomes available or a SGCN status changes. In the future, we will develop a relational database that will allow more flexibility to investigate conservation opportunities. In the interim, Table 5, in conjunction with the guiding principles below, will be used to develop and implement Maine's conservation program.

The following five guiding principles (not presented in order of priority) describe how Maine will develop a sustainable program by the way that funds are allocated to priority species and their conservation needs:

1. Look for opportunities to address the information-gathering and conservation needs of as many species as possible with common approaches and actions (e.g. ecoregional surveys and *Beginning with Habitat*).
2. Provide some funding to address critical population management issues (e.g. heightened law enforcement to protect species vulnerable from take).
3. Provide some funding to address surveys/research to answer critical conservation guidance/policy questions (e.g. lynx in relation to listing petition).
4. Maintain enough steady funding to programs and approaches likely to benefit the most species and address the most important threats over time - especially the systematic ecoregional surveys and landscape habitat conservation programs that maintain habitat for all known species associations. Maine's *Beginning with Habitat* landscape conservation program is our single most important long-term conservation action, and requires stable funding to maintain constant positive movement to affect the broad social issues necessary to effectively conserve landscapes into the future for all wildlife.
5. Maintain enough flexibility to use funds to respond to opportunities in all five program components to leverage and enhance other funds and partnership opportunities.

Integral to the development of a stable and responsive conservation program are expenditures for program administration and dedicated personnel. Program development and implementation will be reviewed at least annually by a CWCS Implementation Team in order to refine and coordinate conservation actions among conservation partners in Maine.

ELEMENT 5 – PROPOSED PLANS FOR MONITORING SPECIES AND HABITATS

In the previous element, we discussed Maine's strategy for conserving SGCN species and the five program components that implement those strategies (Figure 1). In short, Maine's approach is built on a foundation of landscape habitat conservation, which is designed to ensure that adequate habitat remains available in perpetuity to support not only Maine's SGCN, but the full array of wildlife occurring in Maine. Supported on that foundation are two conservation pillars: 1) species-specific population conservation, and 2) species-specific habitat conservation.

We will monitor the success of our strategies by addressing each conservation strategy as follows:

1. Monitoring SGCN species-specific population conservation,
2. Monitoring SGCN species-specific habitat conservation, and
3. Monitoring landscape habitat conservation for SGCN species

Monitoring SGCN Species-specific Population Conservation

SGCN species run the gamut from species for which we have little information, to those that have been shepherded through our species planning process and are being monitored and managed according to the dictates of a formal management system (Figure 1). Although we emphasize the planning process, we also work closely with federal, state, and private conservation partners to develop and participate in cooperative species monitoring programs, which helps us keep track of populations of SGCN that will not be part of the species planning process in the foreseeable future.

Monitoring SGCN, species-specific population conservation is based on each species status in the planning process (Figure 1). Currently, 90 SGCN are covered by species assessments and 72 SGCN are covered by management systems.

Management systems specify how progress toward population, habitat, and other publicly derived goals and objectives will be measured, and clearly defines adaptive management actions that will be implemented to ensure progress toward management goals and objectives. Some management systems have been implemented, while others are quite new or are in need of funding to initiate monitoring and management actions (Boxes 6-10 and 14 of Figure 1). Some management systems will be updated when new management goals and objectives are established. For species with fully implemented management systems, monitoring and management will be based on the management system. For species that have management systems that have not been fully implemented, our focus will be on procuring the resources to fully implement them.

For species for which we have enough information to move the species (or group of species) through the planning process, we will seek opportunities to develop assessments for multiple species. We will not be able to work on all of these species simultaneously, so we will develop assessments by priority as resources and opportunities become available. In the interim, we will

work to ensure populations of these species are monitored on a regular basis (Box 11 of Figure 1); research is designed and conducted to collect data needed to implement effective management programs (Box 12 of Figure 1); education and outreach efforts are implemented to address the public's lack of understanding of the needs and requirements of SGCN and the threats to SGCN and their habitats (Box 13 of Figure 1); and ensure landscape level habitat conservation initiatives are adequate to meet species needs. (Box 14 of Figure 1).

For species for which knowledge about the species is inadequate to develop an assessment, actions will depend on the reason for the lack of adequate information. For some species, we will collect data on their population status, distribution, and trends (Box 11 of Figure 1). For other species, we will design and conduct research to address specific and basic questions about the biology of the species (Box 12 of Figure 1), and for some we will address all these information needs (Boxes 11-13 of Figure 1). Until we have the resources to conduct the needed research and surveys, we will attempt to ensure these species are covered under one of several ongoing monitoring programs or seek opportunities to work with conservation partners and develop efficient monitoring strategies for species not covered by current monitoring programs.

Some SGCN, such as the wolf, are currently listed as Extirpated in Maine, but the possibility exists they may be present or may return to Maine. For other SGCN, we have little knowledge of their distribution and abundance. Through ecoregional surveys and species-specific surveys, we will continue to try and determine the presence, abundance, and distribution of these species (Box 11 of Figure 1). Although information gathered by these surveys is critical to our understanding of the species, we do not consider these surveys to be true monitoring programs.

Monitoring SGCN Species-specific Habitat Conservation

Like Maine's strategy to monitor SGCN species-specific conservation, Maine's strategy for monitoring species-specific habitat conservation for Maine's SGCN species is based on our species planning process (Box 9 of Figure 1). Nearly all species-specific (or group of species) management goals and objectives developed through the species planning process include habitat management goals and objectives that have been established through the public working group process (Box 9 of Figure 1). Each management system contains a component that addresses how we will reach habitat goals and objectives established for a species (or a group of species), how we will monitor our progress toward the goals and objectives, and identifies adaptive management measures that will be implemented under various scenarios.

The ultimate goal is to include all SGCN species under the umbrella of a management system that will monitor progress toward specific habitat conservation goals and objectives. We will place a high priority to fully implement current management systems, and complete management systems for all species for which there are assessments.

Monitoring Landscape Habitat Conservation for SGCN

You will recall from earlier discussions, Maine's CWCS is built on a foundation of landscape habitat conservation (*Beginning with Habitat*), which is designed to ensure that adequate habitat remains available in perpetuity to support not only Maine's SGCN, but the full array of wildlife occurring in Maine. In Elements 3 and 5, we identify several landscape level habitat conservation strategies and the tools we will use to address those strategies. Our primary tool is *Beginning with Habitat*, but a number of other tools were identified that play important roles in ensuring the integrity of our landscape conservation foundation. Some tools will be, or are being, implemented within *Beginning with Habitat*; others are independent of *Beginning with Habitat*, but nevertheless work in concert with *Beginning with Habitat* and help fulfill the

program's mission. In this section we present in tabular form, how we will monitor the success of our landscape conservation strategies, and the tools used to implement those strategies.

We also plan to monitor statewide habitat change through 5-year updates of land cover maps based on satellite imagery, and monitoring data from the USDA Forest Service and Maine forest Service annual forest inventory, and the USDA agriculture census.

ELEMENT 6 - PROCEDURES TO REVIEW THE CWCS

CWCS Development and Review

The formal process began more than two years ago, though MDIFW has been conducting comprehensive wildlife planning and public involvement for nearly forty years. Development of Maine's CWCS was merely an extension and refinement of processes already in place within the State. Since 1990, MDIFW has convened 34 meetings with 9 public working groups to develop management goals and objectives for 217 species, 77 of which are SGCN. In fact, many of the species' needs and conservation actions identified in this Strategy (Chapter 5) are a direct result of this ongoing planning effort.

Review of Maine's CWCS was done, and will continue to occur, at many levels, including an Internal Steering Committee, and Internal Technical Committee, and the CWCS Coalition (or Working Group)

- Internal Steering Committee - Initial meetings occurred monthly and then more frequently (weekly or less) during the six months prior to plan submission.
- Internal Technical Committees - Initial meetings occurred monthly and then more frequently (weekly) during the six months prior to plan submission. Species groups met as often as necessary.
- CWCS Coalition (or Working Group) - Three, 6-hour meetings were convened during CWCS development. There were also frequent communications via mail and email, as necessary.

Future Review

Development of this report is merely the first of many steps along the road to provide effective and visionary leadership in the conservation of all wildlife occurring in Maine. Future review and revision of the CWCS is critical to its continued use as a conservation-planning document.

To satisfy Congressional requirements, States must provide procedures to review the Strategy at intervals not to exceed 10 years. Maine, however, considers its CWCS an ongoing work in progress. As a result, we will coordinate, with partner input, a detailed evaluation of our CWCS progress on species status, important threats and challenges, and conservation actions every five years, coinciding with the existing Federal Assistance reporting cycle. Additional constituent input will be solicited via a variety of meetings and forums, surveys, and print and web-based mediums.

Recognizing that Maine's CWCS is in its formative stages, and to capitalize on the collective expertise and energies of our conservation partners, we will also provide opportunities for regular input, evaluation, and revision of CWCS components within any five-year planning period but especially within the next three years as we work with partners to implement Maine's Strategy. We are planning the first of these meetings in the Fall 2005.

MDIFW will also develop a relational database in Fall 2005 that will track all CWCS-related activities, and the Department will use its existing annual performance reports for Federal Assistance to document progress. This five-year evaluation and revision, in conjunction with more frequent opportunities for input and review by Taxa Committees and the CWCS Implementation Team and Coalitions will allow for course corrections within the 10-year CWCS timeframe. Input and review will primarily occur at three levels: Taxa Committees, CWCS Implementation Team, and CWCS Coalition.

ELEMENT 7 – COORDINATION WITH CONSERVATION PARTNERS

Maine has a long history of successful collaboration among federal, state, and local agencies and the tribes, as well as many non-governmental organizations, to manage and conserve the state's wildlife resources and the lands and waters that provide their habitats. These previous collaborative efforts, and their accomplishments, now provide the foundation on which Maine's CWCS is built. Hence, it is not an accident that Maine's historical and current collaborative efforts cut across all five program components identified in its Strategy: surveys and monitoring, research, population management, habitat conservation, and education and outreach.

Currently, there are 902 on-going collaborative interactions among the primary constituent agencies and other conservation partners in Maine. About 40% of the total interactions among all collaborators working to effect wildlife conservation in the State occur either daily or regularly. Habitat Conservation activities account for more than half (53%) of the total collaborative interactions; and more than a third (37%) of these habitat conservation interactions occur either daily or regularly. An additional third (30%) of the total on-going collaborative efforts occur within the Population Management program component, and 37% of these interactions occur either daily or regularly. Research, Survey and Monitoring, and Education and Outreach account for the final 17% of the total on-going collaborative efforts in Maine.

State agencies and then the federal agencies play the prominent roles in effecting Maine's wildlife population and wildlife habitat conservation strategies. Non-governmental organizations also play an important role in these strategies; the Maine Audubon stands out as being particularly important. The tribes and local agencies represent an important, although tertiary role.

In summary, Maine has strong collaborative interactions to affect its Habitat Conservation and Population Management program components, and these interactions are occurring regularly. The level of collaborative effort to effect Maine's Education and Outreach component represents Maine's best opportunity to increase and promote collaboration among the primary constituent agencies, and other conservation partners, to more fully and broadly achieve its wildlife habitat and population conservation strategies. Maine will explore enhancements during this planning period. In addition, there may be opportunities to improve upon the collaboration among the primary constituent agencies and conservation partners in areas of Research and Surveys and Monitoring. Maine will explore opportunities to improve collaboration in these areas as well.

But having said all of the above, the point to be made is that the collaborative efforts accomplished in Maine are making full use of the existing, available programs and funding sources dedicated to wildlife and habitat conservation. As documented in the CWCS, many Maine species and habitats continue to require additional conservation actions and funding. Current wildlife conservation funding in Maine is dedicated (e.g., USFWS Section 6 funding for Threatened and Endangered species) or "uncertain" and "unstable" (e.g., Maine conservation

license plates, Chickadee income tax check-off, and Maine Outdoor Heritage Fund lottery ticket) or is already fully allocated (e.g., Pittman-Robertson funds and Dingell-Johnson funds) or “competitive” and “uncertain” (e.g., Landowner Incentive Program and competitive State Wildlife Grants). Despite Maine's excellent collaborative efforts, these funding constraints compromise our ability to adequately address those species of greatest conservation need.

ELEMENT 8 - PUBLIC PARTICIPATION

Historic and Ongoing Public Involvement in Maine

Maine has a successful and lengthy history of public involvement in the conservation and management of its fish and wildlife resources.² The most notable example is a 20-year history of public involvement as part of our comprehensive species planning process detailed in Chapters 6 and 8. The composition of public working groups varies with the species or species group under consideration, but is structured to ensure representation of a variety of interests (sportsmen's groups, non-governmental organizations, landowners, tourism groups, public members, concerned citizens, outspoken critics, etc.) as well as a geographical mix. Every effort is made to keep the group balanced. Members of working groups give freely of their time and advice and provide an essential element to the development of species management plans.

In addition, Maine's legislative and rulemaking processes are proxies for the people. A prominent example is our Listing Process and Essential Habitat provisions under the Maine Endangered Species Act (MESA).

Public Involvement in CWCS Development

Since 1990, MDIFW has convened 34 meetings with 9 public working groups to develop management goals and objectives for 217 species, 77 of which are SGCN. In fact, many of the species' needs and conservation actions identified in this Strategy are a direct result of this ongoing planning effort. In addition, we held three, six-hour CWCS Coalition meetings on March 28, April 27, and June 3, 2005. The composition of the Coalition was structured to ensure representation of a variety of interests as well as a geographical mix. Representatives from other state and federal agencies, various sportsmen groups (e.g. Sportsman's Alliance of Maine, Trout Unlimited, Maine Trappers Association, Maine Professional Guide's Association, etc.), wildlife conservation groups (e.g. Maine Audubon, The Nature Conservancy, Isaac Walton League, National Wildlife Federation, Defenders of Wildlife, etc.), landowner groups (e.g. Small Woodlot Owners Association of Maine, Maine Forest Products Council, etc.), Native American Tribes, and other nongovernmental organizations and interested individuals were invited to participate. Members of the Coalition gave freely of their time and expertise, often commuting hundreds of miles and using vacation time or losing wages to participate.

MDIFW hired a facilitator from outside the agency to conduct each Coalition meeting. Subsequent to each meeting, and prior to the next meeting, MDIFW distributed a meeting summary and related materials to all Coalition members, regardless of whether or not they actively participated in the process.

In addition to the involvement of agencies, conservation partners, and public members noted earlier, we conducted a number of additional outreach and public involvement efforts in order to

² For the purpose of this discussion, we consider our “public” to include all natural resource state and federal agencies that do not have jurisdictional responsibilities in Maine, nongovernmental organizations, user groups, private landowners, and the general public.

keep all interested parties informed about the State Wildlife Grant Program and Maine's Comprehensive Wildlife Conservation Strategy. These efforts include:

- Outreach materials and media releases,
- CWCS Website development, and
- Additional opportunities for update (Periodic updates to the Fish and Wildlife Advisory Council, periodic updates and briefings through section and division meetings, and internal communications, and periodic updates to conservation partners, user groups, and public members at meetings, sportsmen's forums, and other events where MDIFW was present).

CWCS will be a permanent feature of MDIFW's website to allow interested parties to review the plan at their leisure. MDIFW will also continue to feature the State Wildlife Grant program and Maine's Comprehensive Wildlife Conservation Strategy in its outreach materials, and will encourage conservation partners to do so as well.

As Mr. Hutchinson so eloquently stated in the opening forward of this document: "Land trusts and other private conservation groups, local communities, private landowners, and other interested stakeholders throughout Maine are willing and ready to step forward and help.... The combined commitment, capacity, wisdom, and resources of such a coalition will deliver unparalleled conservation successes."

*Coming together is a beginning.
Keeping together is progress.
Working together is success.*

Henry Ford